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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

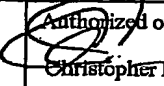
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|--|--|--|-----------------------|
| Applicant's or agent's file reference BAR 20299 | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/US04/09172 | International filing date (day/month/year) 25 March 2004 (25.03.2004) | Priority date (day/month/year) 27 March 2003 (27.03.2003) | |
| International Patent Classification (IPC) or national classification and IPC IPC(7): C12Q 1/04, 1/02; C12M 1/34, 3/00 and US CL: 435/34, 29, 287.1, 288.7 | | | |
| Applicant WALKER, FITZ | | | |

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☒ (sent to the applicant and to the International Bureau) a total of 6 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

| | |
|--|--|
| Date of submission of the demand 26 October 2004 (26.10.2004) | Date of completion of this report 01 August 2005 (01.08.2005) |
| Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230 | Authorized officer  Christopher R. Tate Telephone No. (571) 272-1600 |

Form PCT/IPEA/409 (cover sheet)(January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/09172

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☒ the international application as originally filed/furnished
- ☒ the description:
 - pages 1-32 as originally filed/furnished
 - pages* NONE received by this Authority on _____
 - pages* NONE received by this Authority on _____
- ☒ the claims:
 - pages 33 as originally filed/furnished
 - pages* NONE as amended (together with any statement) under Article 19
 - pages* NONE received by this Authority on _____
 - pages* 34-39 received by this Authority on 09 May 2005 (09.05.2005)
- ☒ the drawings:
 - pages 1-10 as originally filed/furnished
 - pages* NONE received by this Authority on _____
 - pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. 25 and 26
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to the sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to the sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/09172**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

| | | |
|-------------------------------|--------------------|-----|
| Novelty (N) | Claims <u>1-24</u> | YES |
| | Claims <u>NONE</u> | NO |
| Inventive Step (IS) | Claims <u>NONE</u> | YES |
| | Claims <u>1-24</u> | NO |
| Industrial Applicability (IA) | Claims <u>1-24</u> | YES |
| | Claims <u>NONE</u> | NO |

2. Citations and Explanations (Rule 70.7)

Claims 1-24 lack an inventive step under PCT Article 33(3) as being obvious over Yoon et al. (US 5,742,700) in view of Zhang et al. (US 2002/0165837).

Yoon et al. is relied upon for the reasons discussed above. Yoon et al. do not expressly teach using cluster parallel processing or a video camera therein.

Zhang et al. teach using a method of identifying various areas of interest in the medical field such as structural abnormalities including lesions caused by infection (thus, caused by pathogenic microorganisms - see, for example, paragraph 0142) such as by using an image segmentation algorithm to isolate one or more segments via the claimed comparative digitized imaging steps. Zhang et al. also beneficially disclose that the information from medical samples can be analyzed via parallel processing and/or via cluster recursive algorithm analysis of such segments (see, for example, paragraphs 0042, 0057, 0110, and 0112). Zhang et al. further beneficially disclose that an interface such as a video adapter (camera) can be effectively used in connection with the display device disclosed therein (see, for example, paragraph 0075).

It would have been obvious to one of ordinary skill in the art to incorporate the addition features taught by Zhang et al., as discussed above, within the method taught by Yoon et al. so as to help analyze the digital images within the Yoon et al. method. The result-effective adjustment in conventional working parameters (such as using a particular type of segmentation algorithm to analyze and compare such digital images) is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.

Claims 1-24 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

PCT/US04/09172.09052005

IPEA/US

1 1. A method for identifying pathogens, comprising:

2

3 providing an image;

4

5 processing the provided image with an image

6 segmentation algorithm to isolate at least one

7 segment of the provided image that has a feature

8 that is of interest, the image segmentation

9 algorithm comprising a recursive hierarchical

10 segmentation algorithm; and

11

12 comparing the isolated segment of the provided image to

13 a plurality of reference images to determine if the

14 isolated segment corresponds to any of the reference

15 images.

16

17 2. The method according to claim 1 wherein the step of
18 providing the image comprises acquiring the image.

19

20 3. The method according to claim 2 wherein the step of

21 acquiring the image comprises processing the acquired

22 image to provide pertinent portions of the acquired

23 image.

24

PCT/US04/09172.09052005 IPEA/US

1 4. The method according to claim 2 wherein the step of
2 acquiring the image comprises digitizing the acquired
3 image.

4

5 5. The method according to claim 4 wherein the step of
6 acquiring the image further comprises digitally enhancing
7 the digitized image.

8

9 6. The method according to claim 5 further comprises
10 storing the digitally enhanced image in a data storage
11 device.

12

13 7. The method according to claim 1 wherein the provided
14 image comprises an image of a specimen.

15

16 8. The method according to claim 1 wherein the provided
17 image comprises a dental x-ray.

18

19 9. The method according to claim 1 wherein the step of
20 comparing the isolated segment to the plurality of
21 reference images comprises:

22

23 processing the isolated segment with a data mining
24 algorithm to extract particular image data from the

PCT/USD4/09172.09052005

IPEA/IS

- 1 isolated segment; and
- 2
- 3 processing the extracted particular image data and each
- 4 of the reference images with an optical recognition
- 5 algorithm to determine if the extracted particular
- 6 image data matches any of the reference images.
- 7
- 8 10. The method according to claim 9 further comprising:
- 9
- 10 providing a display device; and
- 11
- 12 displaying the extracted data and the results of
- 13 processing the extracted image data and each
- 14 reference image.
- 15
- 16 11. The method according to claim 1 further comprising
- 17 providing a data base having a plurality of reference
- 18 images stored therein.
- 19
- 20 12. A system for identifying pathogens, comprising:
- 21
- 22 a device to provide an image;
- 23
- 24 a data base having at least one reference image stored

PCT/US04/09172 .09052005

IPEA/US

1 therein; and

2

3 an image processing resource to (i) process the
4 provided image with an image segmentation algorithm
5 to isolate at least one segment of the provided
6 image that has a feature of interest, and (ii) to
7 compare the isolated segment of the provided image
8 to the reference image to determine if the isolated
9 segment corresponds to the reference image, the
10 image segmentation algorithm comprising a recursive
11 hierarchical segmentation algorithm.

12

13 13. The system according to claim 12 wherein the device
14 comprises a device to acquire the image.

15

16 14. The system according to claim 13 wherein the device
17 comprises a digitizer to digitize the provided image.

18

19 15. The system according to claim 14 wherein the device
20 further comprises an enhancer device to digitally enhance
21 the digitized image.

22

23 16. The system according to claim 15 further comprising
24 a data storage resource for storing the digitized images.

PCT/US04/09172.09052005

IPEA/US

1 17. The system according to claim 12 wherein the
2 provided image comprises an image of a specimen.
3

4 18. The system according to claim 12 wherein the
5 provided image comprises a dental x-ray.
6

7 19. The system according to claim 12 wherein the image
8 processing resource is configured to process the isolated
9 segment with a data mining algorithm to extract image
10 data from the isolated segment.
11

12 20. The system according to claim 19 wherein the image
13 processing resource processes the extracted image data
14 and the reference image with an optical recognition
15 algorithm to determine if the extracted image data
16 matches the reference images.
17

18 21. The system according to claim 20 further comprising
19 a display device to display the extracted data and the
20 results of processing the extracted image data and the
21 reference image with the optical recognition algorithm.
22

23 22. The system according to claim 12 wherein the image
24 processing resource comprises a paralleling processing

PCT/US04/09172.09052005 IPEA/US

1 resource.

2

3 23. The system according to claim 22 wherein the
4 paralleling processing resource comprises a Beowulf
5 cluster.

6

7 24. The system according to claim 12 wherein the device
8 comprises a video camera.

9